APR 0 1 2005

In re Application of: Arterburn Art Unit: 1731

Serial No. 08/929,836 Case Docket No.6971

Filed: September 15, 1997 Examiner: John Hoffmann

For: **IMPROVED SCREEN FOR FIBERIZING BUSHINGS AND METHOD**

Commissioner of the Patents & Trademarks
Washington, D. C. 20231

Dear Sir:

In response to the Final Office Action mailed on April 26, 2004, and the Examiner's refusal to enter the Rule 1.116 amendment filed on July 14, 2004, Applicant has appealed the final rejection of the application.

APPEAL BRIEF

Real Party In Interest

The real party in interest is Johns Manville Corporation, previously Johns Manville International, Inc., previously Schuller International, Inc., assignee of the Inventor, Arterburn.

Related Appeals and Interferences

None

Status of the Claims

Claims 1, 3 and 5-7 are allowed.

Claims 2, 4 and 8-24 were finally rejected. Applicant appeals from:

The final rejection of claims 2, 4, and 8-24 under 35 USC 112, second paragraph and the final rejection of claims 16-20 under 35 USC 112, first paragraph.

PAGE 5/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

Status of Amendments

After the Final Office Action, an amendment was filed on July 14, 2004, to attempt to resolve the outstanding issues. This amendment was not entered because although claim 21 was identified as "Previously presented" it contained a letter, a, that was struck through. This "a" was actually a remnant of an earlier amendment to the First Office action and unfortunately had been inadvertently overlooked by applicants attorney. The Examiner said that this raised a new issue of whether there were other improper changes in the amendment. The Examiner further stated that the amendment would not be entered for purposes of appeal.

Summary of the Invention:

The invention is an improved bushing for making glass fibers from molten glass. Referring to Figures 2 and 3 and the paragraph spanning pages 1 and 2, bushings are normally made from a precious metal alloy of platinum and rhodium, is a box-shaped device open at the top and having a screen 34 having holes therein, at least one side wall 26, a tip plate 22, usually having a large number of nozzles 24 thereon through which the molten glass flows through to form glass fibers. Different size bushings containing various numbers of nozzles and various sizes of screens are used depending upon the type of glass fiber product being produced. The screen 34 is normally spaced above the tip plate 22 and has a purpose of catching any channel or leg refractory pieces that might come in with the molten glass and also to provide a mixing action to the molten glass. The bushing operates normally at temperatures exceeding 2000 degrees F. The molten glass flowing into the bushing is desirably near the desired fiberizing temperature, but has variations in temperature across the glass stream, and also the bushing looses a lot of heat to the atmosphere so the bushing is heated by passing an electrical current through the metal bushing.

PAGE 6/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

A furnace produces molten glass melting sand and fluxing materials and supplies the molten glass through one or more channels into "bushing legs" that communicates with the channel on one end and also with a plurality of spaced apart bushings through openings in the bottom of each leg, see Figure 1 and page 1, second paragraph. A furnace, which costs in excess of $50 million, lasts for 6 or more years and due to increases in productivity is usually being pulled beyond its design capacity, particularly in the latter years of its life. This over-pull causes the molten glass coming into the legs to be hotter than desired and this causes the first one or two bushings located closest to the channel, the channel positions, to operate at a substantially lower productivity than the bushings further down the leg see page 2 first and second full paragraphs and page and page 9, lines 10-12 of the last full paragraph. Typically there are 8 or more legs connected to the one or more channels with at least 5 and usually 10 or more bushings in each leg.

The bushing of the rejected claims is an improved bushing for use in these fiberizing positions closest to the channel, where the glass temperature exceeds the desired temperature, see page 9, second paragraph. Molten glass is like syrup in that the higher the temperature, the lower its viscosity. When excessively hot glass, having a relatively low viscosity, contacts mainly a mid or center portion of the screen in a conventional bushing, it flows too rapidly through the center portion and down to the tip plate where it is too hot when it reaches the nozzles. When the glass is too hot as it exits the end of the nozzle, it will break causing an interruption of the fiberizing of the bushing. As disclosed in the first full paragraph on page 4 through the second full paragraph of page 5, a novel bushing screen, exemplified by the illustration in Figrure 6, used in the claimed bushing addresses this low productivity problem. This screen does so by having a significantly reduced hole area per unit of screen area in a generally mid or central portion 48 of the bushing screen 34, i.e. the area of the screen 46 where most of the hottest glass contacts the screen 46, while end portions 50, 52, on either side of the generally mid or central portion 48 have a higher hole area per unit of screen area than the generally mid or central portion 48. Importantly, one of the end portions, 52 has a smaller area than the other end portion, 50, to offset

PAGE 7/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

the generally mid or central portion 48 on the screen 46 so that the latter intercepts the major portion of the incoming glass stream. "Since the incoming molten glass stream is flowing first laterally in a downstream direction, it maintains a portion of that vector when it enters the bushing due to the length of the opening in the direction of flow, see page 10, first full paragraph (16.5 to about 20 inches long and 1-3 inches wide) and tends to strike the bushing screen off center. The hole area can be modified by changing the size or the density of the holes or by changing both, see the last full paragraph on page 5 and the next paragraph spanning pages 5 and 6.

Note that the novel screens of the present invention can be used alone in the place of a conventional screen, see page 14, first 6 lines of the last partial paragraph, or as a lay in second screen lying on top of a conventional screen, see page 5, last full paragraph.

Issues:

1. Whether the use of the terms "end portion", "end portions" and "mid or central portion" meets the "particularly points out and claims the invention" as required by 35 USC 112, second paragraph.

2. Whether the term "at least some of the holes having a diameter" meets the requirements of 35 USC 112, second paragraph.

3. Whether there is adequate written description, according to the requirements of 35 USC 112, first paragraph, for the phrase "at least some of the holes have a diameter" occurring in lines 4-5 of claim 16.

4. Whether a period following the word "channel" in claim 23, line 5 should be a comma. It should be a comma and the Examiner is given the authority to change the period to a comma resolving this issue.

PAGE 8/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

Grouping of the claims:

1) Claims 2, 4 and 8-24 stand or fall together on Issue No. 1.

2) Claims 16-20 stand or fall together on Issue Nos. 2.

3) Claims 16-20 stand or fall together on Issue No. 3.

ARGUMENTS:

1. The terms "end portion", "end portions" and "mid or central portion" are all sufficiently definite, as read in light of the specification, and fully meet the requirements of 35 USC 112, second paragraph and the Examiner has erred in concluding that these terms are indefinite.

Claims 2, 4 and 8-24 stand rejected under 35 USC 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention because the terms "end portions", "end portion" and "central portion" are indefinite. The Examiner states that he is at a complete loss as to how to determine the scope of these terms and furthermore that one of ordinary skill in the art would not be able to tell whether their end portions that occur at the end of a screen constitute an "end portion", and the same with "central portion". Applicant believes that the Examiner has erred in this rejection and the reasons on which it is based.

PAGE 9/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

In the Final Action, the Examiner stated that the Board of Appeals in a decision on an earlier appeal indicated that "various terms" were indefinite and that the "end portion" language is one of the various indefinite terms. Applicant disagrees because the Board of Appeals did not so state. Instead the Board of Appeals held that the Examiner could not, having the benefit Applicants' disclosure, arbitrarily devise an embodiment or embodiments and then reject Applicants' claims based on this embodiment. The Board of Appeals did not agree with the Examiners interpretation of the teaching of the reference but used the terms "central portion" and "end portions" and did not indicate any indefiniteness with these terms when using them. In the Advisory Action the Examiner admitted that "Nothing can be ascertained from the Decision on Appeal as to whether the Board would hold the terms indefinite."

All of these rejected terms refer to a screen in the bushing. The dictionary defines the term "portion" as a part of the whole and the use here is consistent with that definition. As is well known to one of ordinary skill in the art of making and using bushings for making glass fibers, and as disclosed herein, many types and sizes of bushings are used in the industry including bushings having widely different numbers of nozzles, i. e. making vastly different numbers of fibers from each bushing depending upon several factors, namely the type of fiber product being produced, and sometimes the size of the furnace. The different size bushings also differ in the physical size of the cross section of the bushing and the dimensions or area of the screen and tip plate. The disclosure of the problems being addressed and the invention for solving problems is described in the Summary on pages 3-5 of the specification. This disclosure adequately describes the terms at issue to one of ordinary skill in the fiberizing bushing art. Further, an embodiment is described in detail beginning on page 12, last partial paragraph through the only full paragraph on page 14, using the type of bushing screen shown in Figures 6, 6A and 6B. From this disclosure it is readily apparent where the "mid or central portion" of the screen is located and where the "end portions" of the screen are located, including the larger of the two end portions, see the last two lines of page 3, the first three lines of page 4, lines 10-13 of the paragraph spanning pages 4 and 5, and as illustrated in Figure 6.

PAGE 10/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

The Examiner admits on page 4, third full paragraph, of the Final Action that applicant is not required to define these "portions" in terms of units of area (or dimensions), and to do so would be meaningless because these vary with the size of the bushing being used with the invention. The Examiner seemed to suggest in the same paragraph that the rejection could be overcome by "removing all mention of all portions, but applicant does not believe that doing so would leave the claims complete because that would leave "ends" of the screen and that would not define the invention. It is end portions, one end portion being on opposite sides of the generally mid or central portion that define the invention in terms of differing hole area per unit area of screen. It is necessary to use a term like "portion", "part", "section", "fragment" "region", etc. to particularly point out and claim the invention. Claims in another patent issued by the Patent Office on the same, or very similar invention, filed after the filing date of the present invention, U.S. Patent No. 5,935,291, uses the term "central region". The term "central portion" is just as definite as "central region". While this is not absolute proof, it certainly is evidence of definiteness. Further, the terms "end portion" and "central or mid portion" is commonly used in patent claims, When the term "end portion" is plugged into the USPTO Patent Search System and only the claims are searched, more than 85,000 patents contain this term in patents issued since 1976. When the term "central portion" is searched in the same manner, more than 35,000 patents were reported to have this term in one or more claims. This is further proof that these terms meet the requirements of 35 USC 112, second paragraph.

The Examiner's reason for thinking otherwise appears to be the way he has interpreted the Decision from an earlier appeal in this application. Applicant's attorney believes the inference the Examiner seems to be making from that decision is totally lacking in support and is in error. The Examiner stated on page 5 of the Final Action that "the Board and Applicant have both determined Stalego (a patent used in a prior art rejection that was reversed by the Board in the earlier appeal) does not have "end portions". This conclusion is erronerous. What Applicant urged was that nothing in the Stalego patent teaches or suggests the

PAGE 11/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

claimed invention structure or the reason for the structure, addressing the problem with channel positions on a leg. What the Board concluded with respect to Stalago was that "a rejection under 35 USC 102 or 103 cannot be based on speculations and assumptions" and that "the Examiner failed to establish a prima facie case of anticipation or obviousness regardless of how the claims are interpreted." (emphasis added).

For the above reasons applicant believes that the terms "end portion", "end portions" and "central portion" as used to describe a bushing screen are not indefinite and do particularly point out and claim the invention in accordance with 35 USC 112, second paragraph, and respectfully requests the Board of Appeals to reverse this rejection.

2. The term "at least some of the holes having a diameter" in the 6th line of claim 16 meets the requirements of 35 USC 112, second paragraph.

Claim 16 stands further rejected under 35 USC 112, second paragraph, because the Examiner states that the 5th line requires a uniform hole size and density. The Examiner states that if only some of the holes have a diameter than some of the holes could not have a diameter and this is indefinite. The Examiner erred in ignoring the full term in the 5th line, "the first screen having a generally uniform hole size and density" (emphasis added). Generally uniform does not mean the exact same size. The specification clearly teaches that although round holes are typically used, other shapes of holes can be used, by drilling, punching or otherwise making holes, slits or other openings in a precious metal sheet, see page 14, the last 4 lines of the first full paragraph, and the 4th through the 6th lines of page 7. Also, on page 7, lines 10-13, it is stated that the "hole size", as used herein to describe the invention, means the diameter of the holes in the screen, or a portion of the screen, or the area of the holes, unless otherwise stated.

From this disclosure, one of ordinary skill in the art would be advised that not all of the holes in the screen need be round, i. e. having a diameter, and that at least some of the holes could be another shape, not having a diameter, so long

PAGE 12/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

as the other limitations of the claims are satisfied, such as generally uniform size and density, in this case size referring to area of the holes when other than round holes are present. Therefore, when reading the claims in the light of the disclosure, the term "at least some of the holes having a diameter" is not inconsistent with, or make indefinite, the term "the first screen having a generally uniform hole size and density.

For the above reasons applicant believes that the term "at least some of the holes having a diameter", as used to describe a bushing screen, are not indefinite or in conflict with the term "having a generally uniform hole size and density" and does particularly point out and claim the invention in accordance with 35 USC 112, second paragraph, and respectfully requests the Board of Appeals to reverse this rejection.

3. There is adequate written description, according to the requirements of 35 USC 112, first paragraph, for the phrase "at least some of the holes have a diameter" occurring in lines 4-5 of claim 16.

Claims 16-20 stand rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement because of the term "at least some of the holes having a diameter". The Examiner stated that the specification does not describe in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Applicant believes the Examiner erred in this conclusion.

The term "at least some of the holes having a diameter" was added by amendment in response to a "lack of antecedent basis" for the term "the diameter" appearing in the 11th line of claim 16. Basis for holes of different shapes in the screen is found on pages 5, 7 and 14 of the specification. The second full paragraph on page 5 describes the use of a screen having smaller hole sizes and/or hole densities, and later it is explained that the use of smaller hole sizes, smaller hole densities or both is used to increase the resistance to

PAGE 13/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

flow of molten glass through the screen or portion of the screen. The term "hole density" is defined at the top of page 7, and in lines 4-6, it is stated that although round holes, are used for purpose of illustration of the invention, other shaped holes can be used in the invention. At the end of that same paragraph it is stated that hole size means the diameter of the holes or the area of the holes. The specification clearly teaches that although round holes are typically used, other shapes of holes can be used, by drilling, punching or otherwise making holes, slits or other openings in a precious metal sheet, see above with page 14, the last 4 lines of the first full paragraph.

From this disclosure applicant believes that one of ordinary skill in the art would reasonably conclude that in the invention disclosed, the holes in the screens need not be round and that not all of the holes need be round or have a diameter. That the shape of the holes are a mere matter of choice and that it is the hole area per unit of screen area in the different portions of the screen that is important.

For the above reasons applicant believes that the term "at least some of the holes having a diameter" does have descriptive support in the specification meeting the requirements of 35 USC 112, first paragraph, and respectfully requests the Board of Appeals to reverse this rejection.

Respectfully submitted,

Robert D. Touslee

Attorney for Applicants

Robert D. Touslee
Registration No. 34,032
(303-978-3927)

PAGE 14/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

Appendix

List of claims involved in the appeal:

2. (Previously presented) A bushing for making fibers from a molten material, said bushing comprising at least one sidewall, a tip plate or orifice plate through which the molten material flows to form the fibers, and a screen having a plurality of holes therethrough, said screen mounted on an interior of the bushing and spaced above a top of the tip plate or orifice plate, said screen being attached to said at least one sidewall, the improvement comprises a generally mid or central portion of the screen having a hole area per unit area of screen that is significantly smaller than a hole area per unit area of screen of two end portions of the screen, one end portion being on either side of the mid or central portion, one of said end portions being smaller in area than the other of said end portions.

4. (Previously presented) The bushing of claim 2 wherein said molten material is glass and said bushing, including the first screen and the second screen, is made from a precious metal or precious metal alloy with a major portion of said metal or metal alloy being platinum and wherein said second screen has a thickness of between about 0.009 to about 0.015 inch.

8. (Previously presented) The bushing of claim 2 wherein said significantly smaller is at least 10 percent smaller and a total hole area in said end portions ranges between about 10 to about 16 percent of total area of the end portions.

9. (Previously presented) The bushing of claim 8 wherein said significantly smaller is at least 20 percent smaller.

10. (Previously presented) The bushing of claim 9 wherein the hole area per unit area of screen in said mid or central portion is at least 30 percent less than the hole area per unit area of said end portions.

PAGE 15/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

11. (Previously presented) A lay in screen of a precious metal or precious metal alloy for laying on top of another screen in a fiberizing bushing, said lay in screen having a plurality of holes therethrough, said lay in screen comprised of a mid or central portion and two end portions, said mid or central portion having a hole area per unit area of the mid or central portion that is significantly less than a hole area of the two end portions per unit area of the two end portions, one of the two end portions being smaller than a remaining end portion, and said lay in screen having a thickness in a range between about 0.009 and 0.011 inch.

12. (Original) The screen of claim 11 wherein said significantly less is at least 10 percent.

13. (Original) The screen of claim 12 wherein said significantly less is at least 20 percent.

14. (Original) The screen of claim 13 wherein said significantly less is at least 25 percent.

15. (Original) The screen of claim 14 wherein said significantly less is at least 30 percent.

16. (Previously presented) A method of making fibers from a molten material wherein said molten material flows into a bushing comprising at least one sidewall and a tip plate or orifice plate through which the molten material flows to form the fibers, said bushing further comprising a first screen having holes therein through which the molten glass flows, the first screen having a generally uniform hole size and hole density, said first screen having a percentage of hole area per unit of screen area of said first screen, said first screen being spaced above said tip plate or orifice plate, said first screen being attached to said at least one sidewall, the improvement comprising using a second screen lying on top of said first screen, said second screen having holes therein through which the molten glass flows, at least some of the holes in said second screen having a size smaller than the size of the holes in said first screen, and said second screen having a

PAGE 16/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

significantly lower percentage of hole area per unit of screen area than the percentage hole area per unit of screen area of said first screen such that resistance to flow of the molten material through the second screen is greater than the resistance to flow of the molten material through the first screen.

17. (Previously presented) The method of claim 16 wherein said molten material is glass and said bushing is made from precious metal or alloys of precious metal containing a majority of platinum, wherein a thickness of said second screen is between about 0.009 and 0.015 inch and wherein said significantly lower is at least about 10 percent lower.

18. (Original) The method of claim 17 wherein said significantly lower is at least about 20 percent lower.

19. (Original) The method of claim 18 wherein said significantly lower is at least about 30 percent lower.

20. (Previously presented) The method of claim 16 wherein said bushing is used to make direct chopped fibers at maximum productivity having a diameter that is at least three microns smaller than the fiber that a bushing containing only said first screen can make at maximum productivity.

21. (Previously presented) A method for forming fibers in at least one multi-bushing leg attached to a channel that receives molten material from a melting tank, by transporting the molten material in a the channel to the at least one multi-bushing legs and by flowing the molten material through a bushing mounted in a first bushing position next to the channel in the at least one multi-bushing leg, said bushing comprising at least one sidewall and a tip plate or orifice plate through which the molten material flows to form the fibers, and a screen in said bushing spaced above said tip plate or orifice plate and having a plurality of holes therein through which the molten material flows, said screen being attached to said at least one sidewall, the improvement comprising using as said screen in said bushing a screen that has holes in at least a mid or central portion and in two

PAGE 17/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

end portions, one end portion being on one side of said mid or central portion and another end portion being on an opposite side of said mid or central portion, said screen having a hole area per unit of screen area in the mid or central portion of the screen that is significantly less than a hole area per unit of screen area in the two end portions of the screen, one of the two end portions of the screen being located closer to said channel than the another end portion, the one of the two end portions located closer to said channel being smaller in area than the another end portion that is located further away from said channel.

22. (Previously presented) The method of claim 21 wherein significantly less than is at least about 30 percent less.

23. (Previously presented) A method for forming fibers from a molten material in at least one multi-bushing leg on a channel that receives the molten material from a melting tank, comprising transporting the molten material in the channel to the at least one multi-bushing leg and by flowing the molten material through a bushing in a first position, next to the channel, in the at least one bushing leg, said bushing comprising at least one sidewall and a tip plate or orifice plate through which the molten material flows to form the fibers, and a first screen spaced above said tip plate or orifice plate and having a plurality of holes therein through which the molten material flows, the first screen being attached to said at least one sidewall, the improvement comprising using a second screen lying on top of the first screen in the bushing, said second screen having a mid or central portion and two end portions, one of the two end portions being on one side of the mid or center portion and another of said two end portions being on an opposite side of said mid or center portion, said second screen having a hole area per unit area of said second screen in the mid or central portion of said second screen that is significantly less than a hole area per unit area of screen in the two end portions of said second screen such that a resistance to flow of the molten material through the mid or central portion of said second screen is greater than a resistance to flow of the molten material through the two end portions of the second screen.

PAGE 18/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18

24. (Previously presented) The method of claim 23 wherein the hole area per unit area of said mid or central portion of said second screen is at least about 10 percent less than the hole area per unit area of screen in the two end portions.

PAGE 19/19 * RCVD AT 4/1/2005 1:22:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:303 978 2323 * DURATION (mm-ss):06-18